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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/757,755	01/09/2001	Alberto Jimenez Felstrom	34650-534PT	8056

7590 12/23/2003

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EXAMINER

CRAVER, CHARLES R

ART UNIT	PAPER NUMBER
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2682

DATE MAILED: 12/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/757,755

Applicant(s)
Feltstrom

Examiner
Charles Craver

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 33 is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-19, 22-27, and 29-32 is/are rejected.
- 7) ☒ Claim(s) 14, 20, 21, and 28 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Jan 9, 2001 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 4, 5 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4-9, 11, 15, 16, 19, 23-25, 27 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Gans et al, US Pat 5,589,797.

Claims 1, 5-8 and 24 : Gans discloses a method for handling interference that is disturbing a desired signal, comprising

providing a signal comprising a desired component and an interference component (Sin, col 3 lines 7-15),

filtering the signal to produce a bandpass filtered signal (col 3 lines 34-36) around the expected fundamental of the interference portion (col 18 lines 60-67),

generating harmonics of the interference signal and estimating the overall interference component via a cuber synthesizer (14, col 3 lines 36-43, col 4 lines 20-59), inherently involving steps of determining the fundamental frequency, and

applying the generated interference estimate to the signal to produce the desired signal (Sout, col 3 line 44-col 4 line 19), and

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feeding back the desired component through a BPF 65 to adjust the interference component estimate (col 15 lines 5-51), which is read as an error determiner.

Claim 4: since Gans discloses use in a wireless system (col 15 lines 52-57), the signal would thus be indirectly from a mobile station microphone. **Claim 9:** Gans discloses sending the harmonic replica as a real (time domain) signal to the summer. **Claim 11:** Gans discloses a summer (18) which adds a negative of the interference replica signal S2.

Claim 25: Gans discloses a method for handling interference that is disturbing a desired signal, comprising

providing a signal comprising a desired component and an interference component (Sin, col 3 lines 7-15),

filtering the signal to produce a bandpass filtered signal (col 3 lines 34-36) around the expected fundamental of the interference portion (col 18 lines 60-67),

generating harmonics of the interference signal and estimating the overall interference component via a cuber synthesizer (14, col 3 lines 36-43, col 4 lines 20-59), inherently involving steps of determining the fundamental frequency, and

applying the generated interference estimate to the signal to produce the desired signal (Sout, col 3 line 44-col 4 line 19).

Claim 27: Gans further discloses means to feedback the desired component through a BPF 65 to adjust the interference component estimate (col 15 lines 5-51), which is read as an error determiner.

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Claims 15, 16 and 30: Gans discloses an apparatus for handling interference that is disturbing a desired signal, comprising

means for providing a signal comprising a desired component and an interference component (Sin, col 3 lines 7-15),

a filter/frequency determiner for filtering the signal to produce a bandpass filtered signal (col 3 lines 34-36) around the expected fundamental of the interference portion (col 18 lines 60-67),

a harmonic interference component generator for generating harmonics of the interference signal and estimating the overall interference component via a cuber synthesizer (14, col 3 lines 36-43, col 4 lines 20-59), inherently involving steps of determining the fundamental frequency, and

a difference determiner for applying the generated interference estimate to the signal via two inputs in order to produce an estimate of the desired signal (Sout, col 3 line 44-col 4 line 19).

Claim 19: Gans discloses a summer (18) which adds a negative of the interference replica signal S2.

Claim 23: Gans discloses that the means may be implemented in a microprocessor (col 15 line 58-col 16 line 2), inherently using software.

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Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 1 above.

Claim 2: While disclosing applicant's invention of claim 1 above, Gans fails to disclose GSM or 217 Hz interference (aka 'bumble bee' interference).

However, GSM was notoriously well-known in the art at the time of the invention, and as such the examiner takes Official Notice of such a feature, asserting that it would have been obvious to one of ordinary skill in the art at the time of the invention to use Gans in a GSM system, since GSM was widely used and popular at the time. Further, such an interfering signal would have been an obvious use for Gans to one of ordinary skill in the art, since Gans discloses mitigating interference, and a 217 Hz component would thus fall into the definition of interference used by Gans when used in a GSM system.

Claim 12: Gans discloses forwarding the desired signal to pre-transmission circuitry (62, 64 etc); since Gans discloses that the method may be used in a cellular base station, it would have been an obvious modification to use such in a mobile station, as it would provide the same quality of transmission in the mobile station as in the base station.

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5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 25 above, and further in view of Hays, US Pat 5,396,189.

While disclosing means to feedback the desired component through a BPF 65 to adjust the interference component estimate (col 15 lines 5-51), Gans fails to disclose a plurality of filters and outputs.

Hays discloses that a number of BPF's may be used in a circuit like that taught by Gans if the wanted signal comprises more than one carrier (col 6 line 67-col 7 line 38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use more than one BPF to adjust the feedback mechanism of Gans to provide better accuracy when more than one signal is wanted.

6. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 30 above, and further in view of Hays.

Please see the rejection of claim 26 above.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 1 above, and further in view of Hays.

Please see the rejection of claim 26 above.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 25 above, and further in view of Shaw, US Pat 5,251,328.

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While disclosing applicant's invention of claim 25 above, and disclosing adjusting the error in real time (i.e. iteratively), Gans fails to disclose adjusting weights or a Fourier expansion.

Shaw discloses a pre-distortion circuit (col 2 lines 45-68) wherein a filter may be adjusted by its Fourier response (col 4 lines 49-68) and weights may be used to adjust the error in the feedback loop (col 4 lines 22-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add such a feature to Gans, as it would improve the filter response and the accuracy of the feedback loop, without the need for extra coefficient transmittal.

9. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 30 above, and further in view of Shaw.

Please see the rejection of claim 29 above.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 15 above, and further in view of Shaw.

Please see the rejection of claim 29 above.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 1 above, and further in view of Shaw.

Please see the rejection of claim 29 above.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gans as applied to claim 15 above.

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While disclosing applicant's invention of claim 15, Gans fails to disclose the use of a PLL. However, PLL's were notoriously well-known in the art at the time of the invention for locking onto an expected frequency component, and as such the examiner takes Official Notice of such a feature, asserting that it would have been obvious to one of ordinary skill in the art at the time of the invention to add such a feature to Gans as it would provide a better lock on the interference signal.

Allowable Subject Matter

13. Claim 33 is allowed.

14. Claims 14, 20, 21 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 14 teaches towards a method for removing interference by separating a signal into a wanted and interfering signal, generating an interference time-domain signal using a harmonic generator to create a signal estimate, subtracting the interference signal from the original signal and feeding back to left-over signal to adjust the harmonic generation, wherein the feeding back includes adjusting a plurality of weights each corresponding to an addend of a Fourier sum corresponding to a harmonic of a fundamental of the interference component. Claim 20 teaches towards a similar method using a plurality of band-pass filters centered each around a harmonic of the interference component. Claim 28 teaches towards performing the steps of feeding back

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the desired signal to adjust the harmonic generation when it is detected that there is an absence of voice activity in the signal.

Claim 33 teaches towards a means in a mobile station for removing interference by separating a signal into a wanted and interfering signal, generating an interference time-domain signal using a harmonic generator to create a signal estimate, subtracting the interference signal from the original signal and feeding back to left-over signal to adjust the harmonic generation, wherein the interference is "bumble bee" interference and the original signal is a microphone signal.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Park, Narahashi, Miedema and Davies disclose feed-forward circuits.

Jin et al discusses a pre-distortion circuit.

Charkani and Killion discuss 217 Hz (bumble bee) interference.

16. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications intended for entry)

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Or:

(703) 872-9314 (for informal or draft communications, please label
"PROPOSED" or "DRAFT")

Hand delivered responses should be brought to Crystal Park II, 2121 Crystal
Drive, Arlington VA, sixth floor (receptionist).


17. Any inquiry concerning this communication or earlier communications from the examiner
should be directed to Charles Craver whose telephone number is (703) 305-3965.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Vivian Chin, can be reached on (703) 308-6739.

Any inquiry of a general nature or relating to the status of this application or proceeding
should be directed to the Group receptionist whose telephone number is (703) 305-4700.

cc

C. Craver
December 15, 2003


CHARLES CRAVER
PATENT EXAMINER